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मानक

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“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 11398-1 (1985): Test chart for horizontal spindle capstan, turret and single spindle automatic lathes, Part 1: Machinable bar diameters greater than 25 mm [PGD 3: Machine Tools]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

TEST CHART FOR HORIZONTAL SPINDLE CAPSTAN, TURRET AND SINGLE SPINDLE AUTOMATIC LATHES PART 1 MACHINABLE BAR DIAMETERS GREATER THAN 25 mm

1. Scope — Describes both geometrical and practical tests on horizontal spindle capstan, turret and single spindle automatic lathes for machinable bar diameter greater than 25 mm and gives the corresponding permissible deviations, with reference to IS : 2063-1962 'Code for testing machine tools'.

1.1 It deals only with the verification of accuracy and applies neither to the testing of the running of the machine (vibrations, abnormal noises, stick-slip motion of components, etc) nor to the machine characteristics (speeds, feeds, etc) which shall generally be checked before testing the accuracy.

Note — Machines with contouring numerical control are excluded from the scope of this standard, and also lathes with sliding heads and lathes with rotating tools.

2. Definitions — The machines referred to in this standard are defined as follows.

2.1 Capstan Lathe — A lathe on the bed of which is fitted a slide base that may be manually moved longitudinally along the bed and clamped in the desired position. On this slide base is mounted a short stroke slide which in turn carries an indexing turret which may be automatically operated by the return motion of the slide or manually indexed.

2.2 Turret Lathe — A lathe on the bed of which is fitted a saddle capable of longitudinal motion, which in turn carries an indexing turret.

2.3 Combination Turret Lathe — A turret lathe with the addition of second saddle which carries a cross slide.

2.4 Cross Feeding Turret Lathe — A lathe on the bed of which is fitted a saddle capable of longitudinal motion, which carries an indexing turret capable of transverse motion.

2.5 Single Spindle Automatic Lathe — A lathe having a frame supporting both the spindle headstock and the turret, the axes of the turret bores in cutting position always being parallel to the spindle axis. The machine shall have the ability to function under fully automatic cycling control. The method of control shall be of any sequential type.

Note — All these types of lathes are manufactured with a variety of turret configurations. The most common types of configuration designated Types A, B and C are described below:

Turret Type A : Circular or multi-sided turret whose axis of rotation cuts the work spindle axis. Whether or not the turret axis is perpendicular to the work spindle axis, the axis of each turret bore must align with work spindle axis in its working position. Tools may be located in the bore or recess, attached to the flat turret face or located and clamped in the bore alone.

Turret Type B : Multi-sided turrets whose axis of rotation does not cut the work spindle axis but is parallel or at right angles to it. Special tool-holders are required which are mounted and located on the turret sides (faces).

Turret Type C : Circular (drum on disc type) turrets whose axis of rotation is parallel to the work spindle axis. Tools are located in the turret bores, which are parallel to the turret axis, and the turret axis is arranged so that the work spindle axis aligns with the axis of the turret bores in their working positions.

3. Machine Size Ranges

3.1 The machines are classified into two ranges on the basis of the following criteria:

Range 1

—Swing diameter over bed ≤ 400 mm
—Nominal bar diameter ≤ 63 mm
—Nominal chuck diameter ≤ 250 mm

Range 2

400 mm < diameter ≤ 800 mm
> 63 mm
> 250 mm

Note — The choice of the criteria is at manufacturer's discretion.

Adopted 28 August 1985

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Gr 7

IS : 11398 (Part 1) - 1985

4. Preliminary Remarks

4.1 To apply these tests, reference shall be made to IS : 2063-1962 especially for installation of the machine before testing, warming up of spindles and other moving parts, description of measuring methods and recommended accuracy of testing equipment.

4.2 The sequence in which the geometrical tests are given is related to the sub-assemblies of the machine and does not define the practical order of testing. In order to make checking or mounting of instruments easier, tests may be carried out in any convenient sequence.

4.3 When inspecting a machine, it is necessary to carry out all the tests described in this standard, excepting those tests which may be omitted in mutual agreement between the buyer and the manufacturer.

4.4 Practical tests shall be made with finishing cuts and not with roughing cuts which are liable to generate appreciable cutting forces. The actual feeds and speeds shall be selected by the manufacturer to suit the particular machine and could be in the order of 0.1 mm for the depth of cut and 0.1 mm per revolution for the feed. Test pieces made of a free-cutting metal shall be used for the practical tests.

4.5 When establishing the tolerance for a measuring range different from that indicated in this standard (see 2.3.1.1 of IS : 2063-1962), it shall be taken into consideration that the minimum tolerance is 0.005 mm. For any proportional value, the calculated value shall be rounded off to the nearest 0.002 mm. However, the least count of all measuring instruments need not be finer than 0.002 mm.

4.6 Whenever alternate methods of testing are suggested, the choice of actual method of testing is left to the manufacturer.

4.7 For the purpose of this standard, various methods of expressing permissible deviation are employed, each having a particular type of application. The methods employed are as follows:

000/000 for deviations of perpendicularity which are ratios.

000 for any length of 000 for deviations of straightness and parallelism; this expression is used, in fact, for local permissible deviations, the measuring length being obligatory.

000 for 000 for deviations of straightness and parallelism; this expression is used to recommend a measuring length but in this case the proportionality rule comes into operation if the measuring length differs from those indicated.

5. Testing Instruments — The testing instruments shall be of the approved type and shall be calibrated at a recognized temperature conforming to the relevant Indian Standards.

6. Accuracy Requirements — The tests to be carried out, the instruments required, the maximum permissible deviations and the manner of carrying out the tests shall be as detailed in the test chart.

TEST CHART FOR HORIZONTAL SPINDLE CAPSTAN, TURRET AND SINGLE SPINDLE AUTOMATIC LATHES
PART 1 MACHINABLE BAR DIAMETER GREATER THAN 25 mm

Type _____

Order No. _____

Customer _____

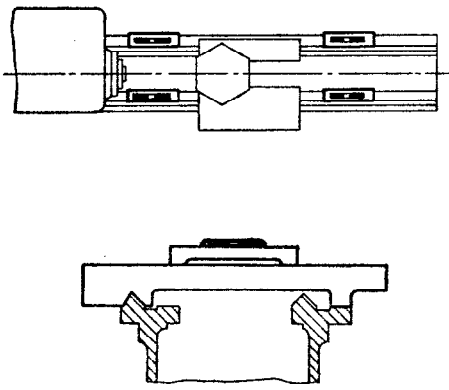
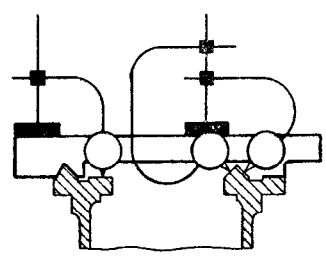
Machine No. _____

Date _____

Inspector _____

I PRELIMINARY OPERATIONS

All dimensions in millimetres.

SI No.	Figure	Object	Measuring Instruments	Reference to IS : 2063-1962 and/or Instructions for Testing	Permissible Deviations	Actual Error
(1)	(2)	(3)	(4)	(5)	(6)	(7)
A — BED						
1.		<p>Verification of levelling of slideways</p> <p>a) <i>In the longitudinal direction:</i></p> <p>Straightness of slideways in the vertical plane</p> <p>b) <i>In the transverse direction:</i></p> <p>Slideways shall be in the same plane</p>	<p>Precision levels, optical or other methods</p> <p>Precision levels</p>	<p>3.3, 3.3.1, 3.3.2, 3.3.3, 3.2.1, 5.1.1.2(b)(1), 5.1.1.2 (b)(2)</p> <p>The measurements shall be carried out at a number of positions equally spaced along the length of the bed</p> <p>5.3.1.2(g)</p> <p>Place a level transversely on the slideways and take measurements at a number of positions equally spaced along the length of the slideways. The variation of level measured at any position shall not exceed the permissible deviation</p>	<p>a) <i>Range 1 :</i> 0.02 for any measuring length of 1000</p> <p><i>Range 2 :</i> 0.03 for any measuring length of 1000</p> <p>b) <i>Variation level :</i></p> <p><i>Ranges 1 and 2 :</i> 0.04 for 1000</p>	
2.		<p>Checking of parallelism of the turret slide slideways to the slide base slideways</p> <p>This test applies only to machines having two sets of guideways integral with the bed</p>	Dial gauge	<p>5.3.2.2(d)</p> <p>This test is made by means of a special support guided on the outside slideways, and supporting a dial gauge checking the parallelism of the inner slideways.</p>	<p><i>Range 1 :</i> 0.01 for any length of 1000</p> <p><i>Range 2 :</i> 0.02 for any length of 1000</p>	

TEST CHART FOR HORIZONTAL SPINDLE CAPSTAN, TURRET AND SINGLE SPINDLE AUTOMATIC LATHES

PART 1 MACHINABLE BAR DIAMETER GREATER THAN 25 mm

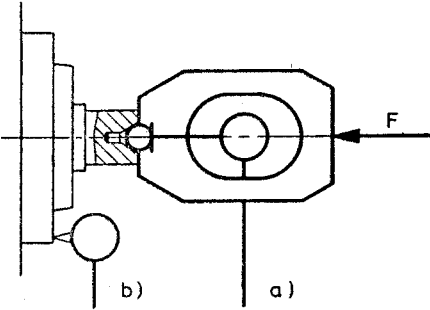
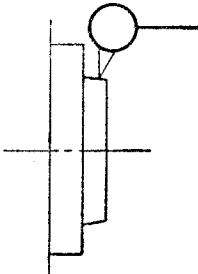
Type _____
Machine No. _____

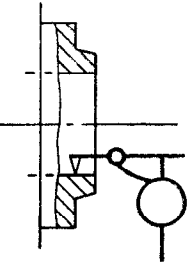
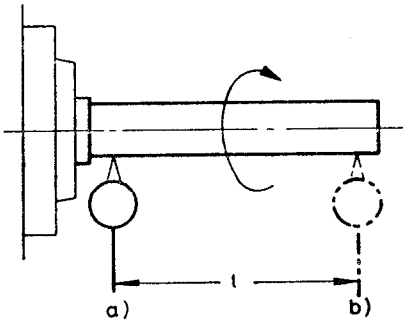
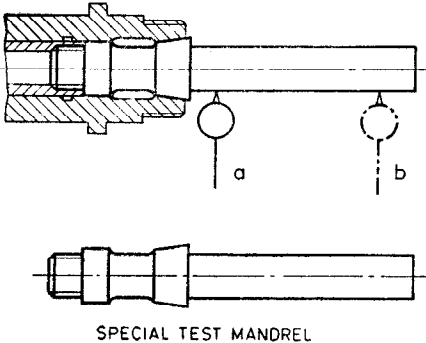
Order No. _____
Date _____

Customer _____
Inspector _____

II GEOMETRICAL TESTS

All dimensions in millimetres.

SI No.	Figure	Object	Measuring Instruments	Reference to IS : 2063-1962 and/or Instructions for Testing	Permissible Deviations	Actual Error
(1)	(2)	(3)	(4)	(5)	(6)	(7)
B — HEADSTOCK SPINDLE						
1.		a) Periodic axial slip b) Camming of the spindle face	Dial gauge and special device	a) 5.5.2.2 and 5.5.2.2(a) The value of force F to be applied for the tests (a) and (b) shall be specified by the manufacturer b) 5.5.3.2, 5.5.3.2(a) and 5.5.3.2(b)	a) 0.01 b) Range 1 : 0.015 including periodic axial slip Range 2 : 0.02 including periodic axial slip	
2.		Runout of the centring diameter on the spindle nose	Dial gauge	5.5.1.2(a) The value of force F to be applied shall be specified by the manufacturer	Range 1 : 0.01 Range 2 0.015	

3.		Runout of the spindle locating bore This test applies only to machines with a locating bore for mounting work holding fixtures	Dial gauge	5.5.1.2(b)	Range 1 : 0.01 Range 2 : 0.15	
4.		Runout of the work spindle internal taper: a) at the spindle nose b) at a distance of 300 from the spindle nose This test applies only to machines with internal taper spindle bore	Dial gauge and test mandrel	5.5.1.2(b)	Range 1 : a) 0.01 b) 0.02 Range 2 : a) 0.015 b) 0.03	
5. Contd	 SPECIAL TEST MANDREL	Runout of the collet internal seating in the spindle: a) at the spindle nose b) at a distance of 100	Test mandrel and dial gauge	5.5.1.2(b)	a) 0.015 b) 0.030	

TEST CHART FOR HORIZONTAL SPINDLE CAPSTAN, TURRET AND SINGLE SPINDLE AUTOMATIC LATHES

PART 1 MACHINABLE BAR DIAMETER GREATER THAN 25 mm

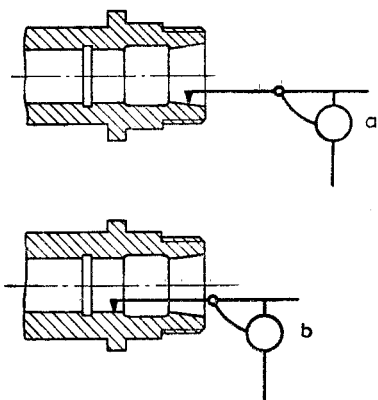
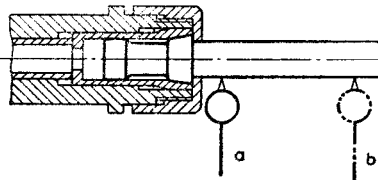
Type _____
Machine No. _____

Order No. _____
Date _____

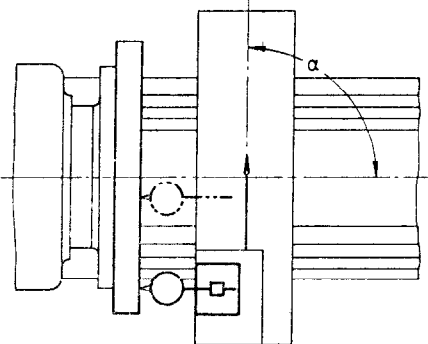
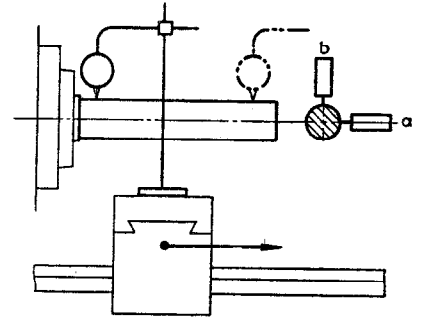
Customer _____
Inspector _____

II GEOMETRICAL TESTS

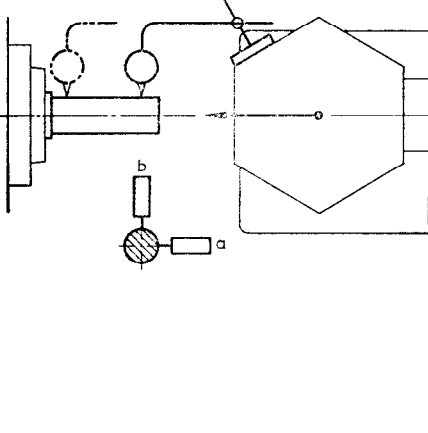
All dimensions in millimetres.

SI No.	Figure	Object	Measuring Instruments	Reference to IS : 2063-1962 and/or Instructions for Testing	Permissible Deviations	Actual Error
(1)	(2)	(3)	(4)	(5)	(6)	(7)
B — HEADSTOCK SPINDLE						
5. <i>Contd</i>		<p><i>Alternative</i></p> <p>Measurement by touching directly the front seating cone and the back register</p> <p>This test applies only to bar machines with work spindles for draw back collets</p>	Dial gauge	5.5.1.2(b)	0.010	
6.		<p>Runout of the collet internal seating in the spindle:</p> <p>a) at the spindle nose b) at a distance of 100</p> <p>This test applies only to bar machines with work spindles for closing sleeve type (dead length) collets</p>	Test mandrel and dial gauge	5.5.1.2(b)	a) 0.02 b) 0.04	

C — CROSS SLIDE BASE

7.		<p>Squareness of the transverse movement of the cross slide to the spindle axis</p> <p>This test is applicable to combination turret lathes only</p> <p>Note — For chucking machines only, the practical test at SI No. 2 may be used as an alternative to this test.</p>	Dial gauge and flat disc or straight edge	<p>5.4.2.3 and 3.2.2</p> <p>Mount the dial gauge on the cross slide</p>	<p>0.02/300</p> <p>Direction of deviation $\alpha > 90^\circ$</p>	
8.		<p>Parallelism of the longitudinal movement of the intermediate carriage to the spindle axis:</p> <p>a) in a horizontal plane b) in a vertical plane</p>	Dial gauge and test mandrel	<p>5.3.2.2(a)</p> <p>Mount the dial gauge on the cross slide</p>	<p>a) 0.005 for a measuring length of 100 (free end of the mandrel forwards only)</p> <p>b) 0.007 for a measuring length of 100 (free end of the mandrel upwards only)</p>	

D — TURRET

9.		<p>Parallelism of turret movement on the bed to the spindle axis:</p> <p>a) in a horizontal plane b) in a vertical plane</p> <p>This test applies only to turret lathes</p>	Dial gauge and test mandrel	<p>5.3.2.2(b)</p> <p>Mount the dial gauge on the turret</p>	<p>a) 0.02 for a measuring length of 300</p> <p>b) 0.02 for a measuring length of 300 (upwards only)</p> <p>Note — The permissible deviation remains 0.02 for single spindle automatic lathes with a stroke less than 300.</p>	
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TEST CHART FOR HORIZONTAL SPINDLE CAPSTAN, TURRET AND SINGLE SPINDLE AUTOMATIC LATHES

PART 1 MACHINABLE BAR DIAMETER GREATER THAN 25 mm

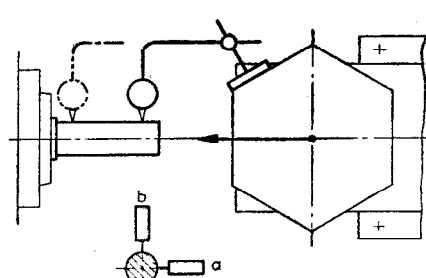
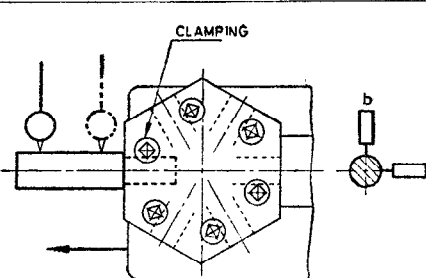
Type _____
Machine No. _____

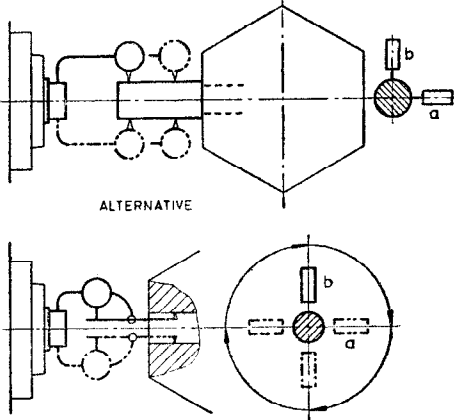
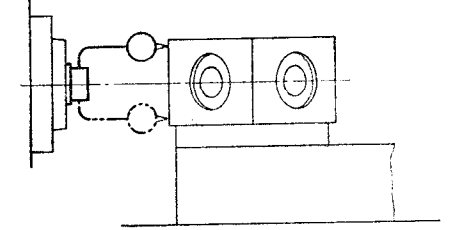
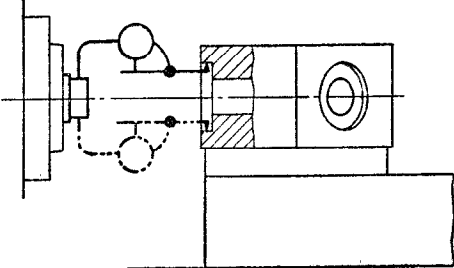
Order No. _____
Date _____

Customer _____
Inspector _____

II GEOMETRICAL TESTS

All dimensions in millimetres.

SI No.	Figure	Object	Measuring Instruments	Reference to IS : 2063-1962 and/or Instructions for Testing	Permissible Deviations	Actual Error
(1)	(2)	(3)	(4)	(5)	(6)	(7)
D — TURRET						
10.		<p>Parallelism of the work spindle axis to the turret top slide movement of the capstan slide:</p> <p>a) in a horizontal plane b) in a vertical plane</p> <p>This test applies only to capstan lathes</p>	Dial gauge and test mandrel	<p>5.3.2.2(b)</p> <p>Mount the dial gauge on the turret. The relative positions of the turret top slide and the capstan slide shall be specified by the manufacturer</p>	<p>a) 0.015 for a measuring length of 150.</p> <p>b) 0.02 for a measuring length of 150 (up-ward only)</p>	
11.		<p>Parallelism of the turret bores with the turret movement:</p> <p>a) in a horizontal plane b) in a vertical plane</p> <p>This test does not apply to machines with a turret configuration type B or to those without tool shank clamping facilities</p>	Dial gauge and test mandrel	<p>5.3.2.2(b)</p> <p>The test mandrel shall not be clamped in the turret but shall be a tight fit. Where the turret bores are relieved, the test mandrel shall be lightly clamped using the locking mechanism</p> <p>The test shall be repeated for each turret bore</p>	<p>a) and b) 0.02 for 300</p>	

12.		<p>Alignment of the work spindle axes with turret bore axes:</p> <p>a) in a horizontal plane b) in a vertical plane</p> <p><i>Alternative</i> Checking by direct measurement of the turret bores. This test does not apply to machines with a turret configuration Type B</p>	Dial gauge in rigid spindle mounting with or without test mandrel	<p>5.3.2.2 The dial gauge shall be at two positions, one of which shall be as close as possible to the turret face. The test mandrel shall not be clamped in the turret but must be a tight fit. Where turret bores are relieved, the test mandrel shall be lightly clamped using the locking mechanism</p> <p>The test shall be repeated for each turret bore</p> <p>Note — In case test mandrel is used, the length over which the measurement is taken shall be specified by the manufacturer.</p>	<p>a) and b) <i>Range 1</i> 0·015 <i>Range 2</i> 0·025</p>	
13.		<p>Squareness of the turret faces to the work spindle axis:</p> <p>a) in a horizontal plane b) in a vertical plane</p> <p>This test does not apply to machines with turret configuration Types B and C</p>	Dial gauge in rigid spindle nose mounting	<p>5.4.1.1 and 5.4.1.1(b)(3) Mount the dial gauge as close as possible to the spindle nose Repeat the test for each turret face</p>	<p>a) and b) 0·015/100</p>	
14.		<p>Alignment of turret recess axes with the work spindle axis:</p> <p>a) in a horizontal plane b) in a vertical plane</p> <p>This test applies only to machines with turret configuration Type A</p>	Dial gauge (lever type) in rigid spindle nose mounting, and as close as possible to the spindle nose	<p>5.3.4.2 The turret shall be in its forward position or as near to the spindle as possible. Repeat the test for each turret recess</p>	<p>a) and b) <i>Range 1</i> 0·015 <i>Range 2</i> 0·025</p>	

TEST CHART FOR HORIZONTAL SPINDLE CAPSTAN, TURRET AND SINGLE SPINDLE AUTOMATIC LATHES

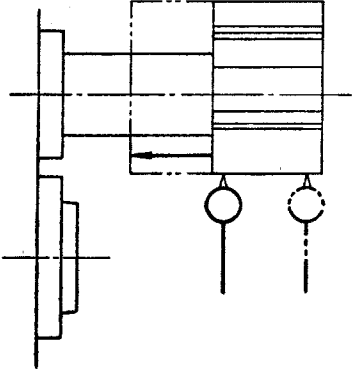
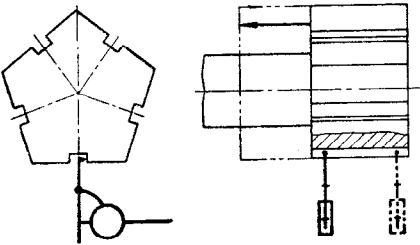
PART 1 MACHINABLE BAR DIAMETER GREATER THAN 25 mm

Type _____
Machine No. _____

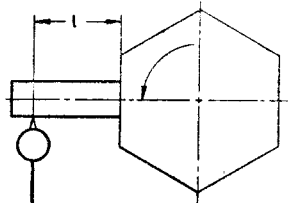
Order No. _____
Date _____

Customer _____
Inspector _____

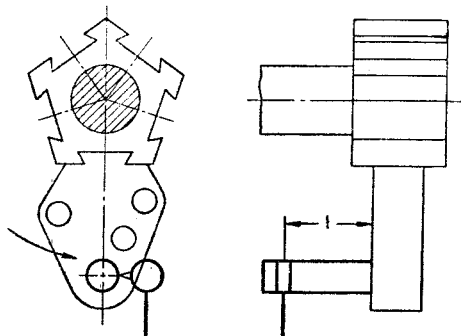
II GEOMETRICAL TESTS All dimensions in millimetres.

SI No.	Figure	Object	Measuring Instruments	Reference to IS : 2063-1962 and/or Instructions for Testing	Permissible Deviations	Actual Error
(1)	(2)	(3)	(4)	(5)	(6)	(7)
D - TURRET						
15.		<p>Parallelism of the turret faces with the turret movement</p> <p>This test applies only to machine with turret configuration Type B</p>	Dial gauge and special device if specified by the manufacturer	<p>5.3.2.2(a)</p> <p>Repeat the test, made over the whole cutting stroke, for each turret face, in the indexing position</p>	0.015 for any measuring length of 100	
16.		<p>Parallelism of turret tool holder location slot (or tenon) to the turret movement</p> <p>Parallelism of the turret tool holder location slot (tenon)</p> <p>This test applies only to machines with turret configuration Type B</p>	Dial gauge and special control device if specified by the manufacturer	<p>5.3.2.2(a)</p> <p>Repeat the test, made over the whole cutting stroke, for each turret face, in the indexing position</p>	0.015 for any measuring length of 100	

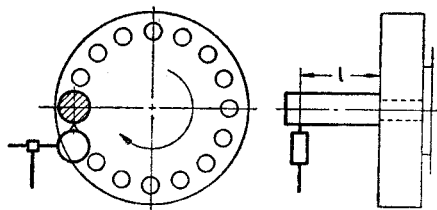
17.



TYPE A



TYPE B



TYPE C

Repeatability of the turret indexing

Note — Practical test SI No. 1 (c) may be used as an alternative to this test.

Dial gauge and test mandrel

The test mandrel shall be held in the bore of a tool holder which is mounted on to the turret and set on the spindle centre line. Mount the dial gauge on a fixed part of the machine

With the turret in mid position of stroke, position the dial gauge against the mandrel. Make a first reading.

Then withdraw the turret, index through 360° , and reposition (under automatic cycle, if any)

Note the new reading

Repeat the procedure at least three times on each turret station

The error is represented by the difference between maximum and minimum readings

Turret lathes
0'01, Measurement made at a distance of 100 from the turret face

Capstan lathes
0'01, Measurement made at a distance of 75 from the turret face

Single spindle automatic lathes, Type A
0'01, Measurement made at a distance of 50 from the turret face

Single spindle automatic lathes, Types B and C :
0'01, Measurement made as close as possible to the tool holder face

TEST CHART FOR HORIZONTAL SPINDLE CAPSTAN, TURRET AND SINGLE SPINDLE AUTOMATIC LATHES

PART 1 MACHINABLE BAR DIAMETER GREATER THAN 25 mm

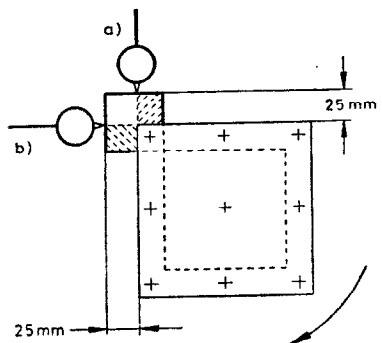
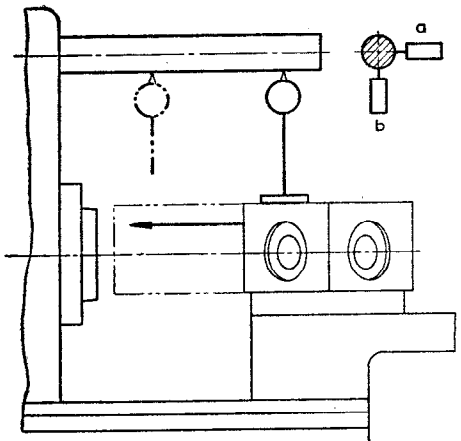
Type _____
Machine No. _____

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II GEOMETRICAL TESTS

All dimensions in millimetres.

SI No.	Figure	Object	Measuring Instruments	Reference to IS : 2063-1962 and/or Instructions for Testing	Permissible Deviations	Actual Error
(1)	(2)	(3)	(4)	(5)	(6)	(7)
D — TURRET						
18.		<p>Repeatability of indexing of the square turret on cross slide:</p> <p>a) in a radial plane b) alternative in an axial plane</p>	Dial gauge and test bar	<p>6.4.2 and 6.4.2.1</p> <p>The test bar shall be mounted in the square turret to simulate a tool. Mount the dial gauge on a fixed part of the machine. Take the first reading. Then index the turret through 360°. Note the new reading. Repeat at least three times for each turret face. The error is shown by the difference between maximum and minimum readings. Note — For (a) and (b) the dial gauge shall be set in the plane of the face of the turret.</p>	a) and b) 0.02 at a distance of 25 from turret face.	
19.	<p>On some machines the steady bar is fixed to the head stock; on others, it is fixed to the turret.</p> 	<p>Parallelism of the steady bar with the turret movement:</p> <p>a) in a horizontal plane b) in a vertical plane</p>	Dial gauge	5.3.2.2(b)	a) and b) 0.02 for each measuring length of 300	

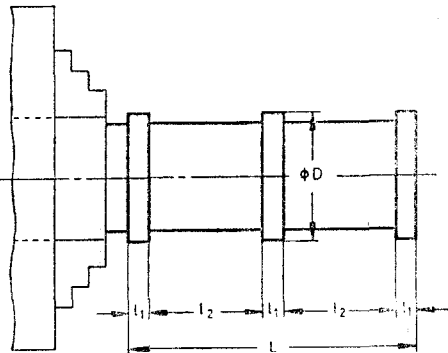
TEST CHART FOR HORIZONTAL SPINDLE CAPSTAN, TURRET AND SINGLE SPINDLE AUTOMATIC LATHES
PART 1 MACHINABLE BAR DIAMETER GREATER THAN 25 mm

Type _____
 Machine No. _____

Order No. _____
 Date _____

Customer _____
 Inspector _____

III PRACTICAL TESTS
 All dimensions in millimetres.

SI No:	Figure	Nature of Test and Cutting Conditions	Checks to be Applied	Measuring Instruments	Reference to IS : 2063-1962 and/or Instructions for Testing	Permissible Deviations	Actual Error
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	 <p>For bar machines: $D = 0.8 \times \text{nominal bar capacity}$ $L = 0.8 \times \text{maximum cutting stroke}$ or $2.5 \times \text{nominal bar capacity}$. Retain for L the smaller of these values up to a maximum of 150 mm For chucking machines: $D = 0.3 \times \text{nominal chuck diameter (up to a maximum value of 150)}$ $L = 0.8 \times \text{maximum cutting stroke}$ or $0.8 \times \text{nominal chuck diameter}$. Retain for L the smaller of these values, up to a maximum value of 200 Note — Where the value of L exceeds 100, additional intermediate bands with a maximum spacing of 40 shall be machined.</p>	<p>Turning of a cylindrical test piece held in or on the spindle nose from the turret with a single point tool mounted on one station of the turret and on the cross slide. For test (C) repeatability, at least 3 test pieces shall be machined. Turret shall be indexed through 60° before machining a new test piece</p> <p>As an alternative, practical test at SI No. 1 (c) may be carried out on stub test pieces with a minimum length of cut 10</p> <p>Test piece (or pieces) material together with type and form of tool, feed, depth of cut and cutting speed shall be specified by the manufacturer</p> <p>This test applies to both bar and chucking machines</p>	<p>a) <i>Circularity</i> Variation in radius at the location end of the test piece for at least 4 readings</p> <p>b) <i>Consistency of the machined diameters</i> This test applies to turrets with an axis parallel or perpendicular to the spindle axis</p> <p>The consistency of the machined diameters is the variation between the diameters of each end of each test piece measured in a single axial plane</p> <p>Three or four measurements shall be made along the length of the test piece, dependent on its length</p> <p>c) <i>Repeatability</i> Variation between diameters of the location end of the test pieces, measured in a single plane marked on the spindle nose</p>	Micro-meter and roundness measuring instruments	3.1, 3.2, 4.1, 4.1.1, 4.1.2, 4.1.3, 4.2 and 4.2.1	<p>a) 0.005</p> <p>b)</p> <p>1) for cross slides: 0.02 per 100</p> <p>2) for turrets: 0.02 per 100</p> <p>3) for capstan: 0.025 per 100</p> <p>If more than two bands on test piece, then permissible variation between adjacent bands shall be: 0.01</p> <p>c)</p> <p>1) For turret lathes and single spindle automatic lathes: 0.025</p> <p>2) For capstan lathes: 0.035</p>	

TEST CHART FOR HORIZONTAL SPINDLE CAPSTAN, TURRET AND SINGLE SPINDLE AUTOMATIC LATHES

PART 1 MACHINABLE BAR DIAMETER GREATER THAN 25 mm

Type _____

Order No. _____

Customer _____

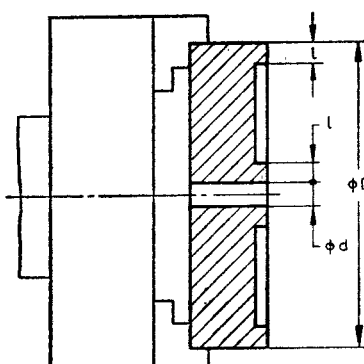
Machine No. _____

Date _____

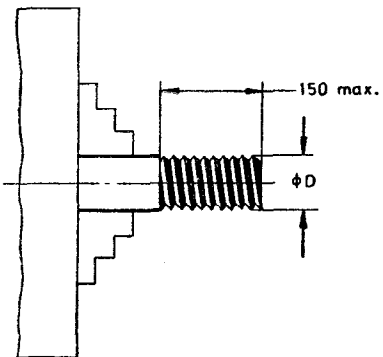
Inspector _____

III PRACTICAL TESTS

All dimensions in millimetres.

SI No.	Figure	Nature of Test and Cutting Conditions	Checks to be Applied	Measuring Instruments	Reference to IS : 2063-1962 and/or Instructions for Testing	Permissible Deviations	Actual Error
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2.	 <p>$d = l = 10$</p> <p>$D = 0.75 \times \text{nominal chuck diameter}$ or $1.8 \times \text{maximum cutting stroke of the cross slide (whichever is smaller)}$</p>	<p>Face a test piece held in or on the spindle nose from the cross slide (or cross slides). Single point tools are mounted on the cross slide (or cross slides). Test piece material together with type and form of tool, feed, depth of cut and cutting speed to be specified by the manufacturer</p> <p>Note — Where two tool posts are provided on a single slide, then only the one intended for facing need be tested.</p> <p>This test applies only to chucking machines</p>	Faced surface flatness (concave only)	Straight edge and slip gauge or dial gauge	3.1, 3.2, 4.1, 4.1.1, 4.1.2, 4.1.3, 4.2 and 4.2.1	0.015 for a diameter of 300	

3.



Maximum length of thread cut 150. Diameter of test piece as close as possible to that of the lead screw. Thread pitch half that of the lead screw

Threading according to IS : 4218 'ISO metric screw thread', a cylindrical test piece with a single point tool

The start of the screw thread is taken from any point on the lead screw

This test applies only to machines with lead screw control

Accuracy of the pitch

Special instruments of tested precision

3.1, 3.2.2, 4.1.1, 4.1.2, 4.1.3, 4.2.1, 6.1.1.4, 6.2, 6.2.0, 6.2.1, 6.2.2 and 6.2.3

The screw thread shall be clean without flats or waviness

Cumulative pitch error 0.02 for any measured length of 60

EXPLANATORY NOTE

This standard is generally based on ISO 6155/1-1981 'Acceptance condition for horizontal spindle capstan, turret and single spindle automatic lathes — Testing of accuracy : Part I Machinable bar, diameter greater than 25 mm', issued by the International Organization for Standardization (ISO).

In this standard, permissible deviation values have been specified for geometrical test SI No. 7 and 11 based on India's comments on ISO/DIS 6155/1, which differ from the corresponding values given in published ISO 6155/1-1981. The corresponding values given in ISO 6155/1-1981 are:

- 1) 0.01/100; and
- 2) for (a) and (b) 0.015 for measuring length of 100 respectively.

Separate standard on single spindle automatic lathes having machinable bar diameters less than 25 mm shall be formulated after the ISO standard on this subject is published.

AMENDMENT NO.1 OCTOBER 1988

TO

IS:11398(Part 1)-1985 TEST CHART FOR HORIZONTAL
SPINDLE CAPSTAN, TURRET AND SINGLE SPINDLE
AUTOMATIC LATHES

PART 1 MACHINABLE BAR DIAMETERS GREATER THAN 25 mm

(Page 5, Test Sl No. 3, col 6, range 2) -
Substitute '0.015' for '0.15'.

(Page 13, Test Sl No. 1, col 3, para 2, last
line) - Substitute the following for the existing
line:

'Turret shall be indexed through 360° before machining
a new test piece.'

(EDC 11)

**AMENDMENT NO. 2 AUGUST 1996
TO**

**IS 11398 (Part 1) : 1985 TEST CHART FOR
HORIZONTAL SPINDLE CAPSTAN, TURRET AND
SINGLE SPINDLE AUTOMATIC LATHES**

PART 1 MACHINABLE BAR DIAMETERS GREATER THAN 25 mm

Substitute 'IS 2063 : 1981/ISO 230/1 : 1986 Acceptance code for machine tools — Geometric accuracy of machines operating under no-load or finishing conditions (*first revision*)' for 'IS 2063 : 1962 Code for testing machine tools' wherever it occurs in the standard.

(PE 03)

Reprography Unit, BIS, New Delhi, India